City of Huntington Beach
Energy Action Plan

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EXECUTIVE SUMMARY

The city of Huntington Beach has a long-standing commitment to protect the environment and has recently expanded its focus to include sustainability. One expression of this commitment is this Energy Action Plan (EAP). This document outlines the city's history and commitment to (a) eliminating energy waste, (b) preparing for peak oil production and (c) reducing greenhouse gas emissions. The most significant action taken to date was the city council establishing a need for a full time energy project manager in 2008.

The areas of focus for the city's EAP are:

- Utility Bill audits and expenditure tracking
- Developing and managing energy efficiency projects
    - Utility partnerships
    - Monitoring Based Commissioning (MBCx)
    - IS energy efficiency
    - Energy efficiency retrofits/upgrades
    - HVAC and controls retrofits
- Managing Federal, State and utility grants and incentive programs
- Developing and managing renewable energy programs
- Developing energy & sustainability guidelines/policies
- Design best practices and resource sharing regionally through Local Government Energy Management Services Program (LGEMSP)

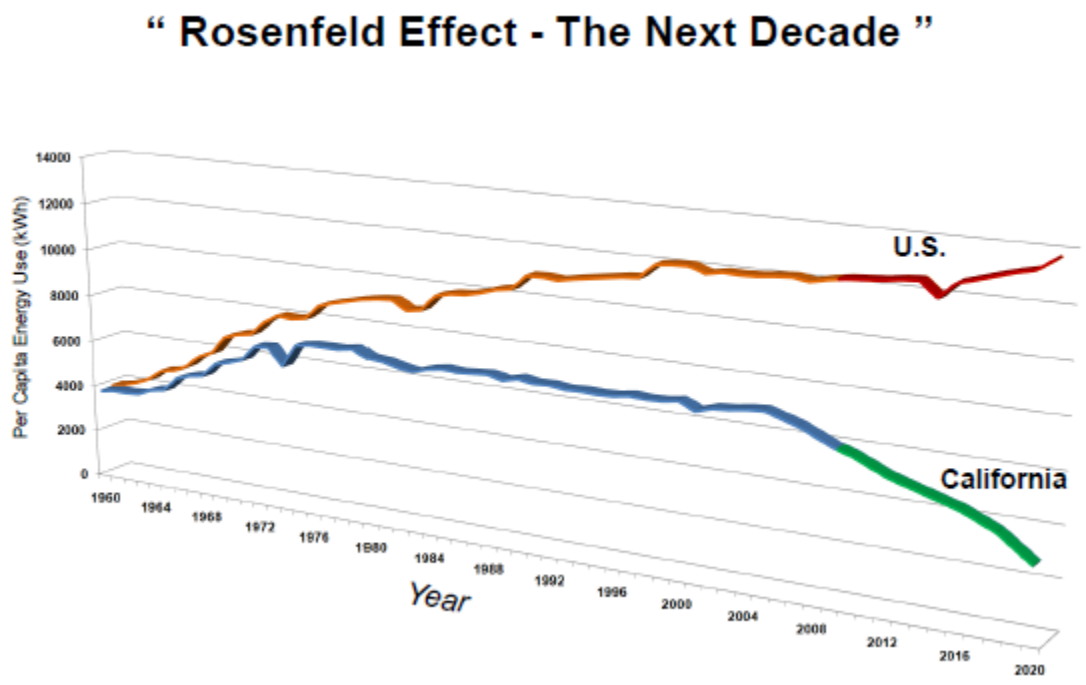
The city of Huntington Beach has developed a solid foundation from which to support future state and federal energy efficiency policy, while creating a resilient city poised to succeed in a carbon (fossil fuel) constrained economy. The city has already achieved success in its own facilities, improving their energy effectiveness. The community-wide strategy will meet success eliminating energy waste through the use of community based social marketing. Staff will aggressively seek funding for programmatic support to support the success of the pending community-wide strategies.

The methods, procedures and policies the city develops can serve as a template for other Orange County Cities in becoming more sustainable. Huntington Beach led the last energy revolution in Southern California with oil production over the last century and is poised to lead the next clean energy revolution in Southern California as we prepare for the impacts from peak oil production and climate change.

SECTION 1 – INTRODUCTION

Huntington Beach's commitment is to become a sustainable and resilient community that enhances quality of life and local control for our citizens and region. Related specifically to energy issues, the Energy Action Plan (EAP) will focus Huntington Beach's attention on the twin challenges of peak oil and risks from climate change. A significant number of the mitigation measures overlap between the twin challenges. The most effective strategy is to eliminate energy waste which will reduce pollution and reliance on declining oil production. Additionally, introducing resilience as a decision-making criterion will build least wasteful practices into business as usual.

The city council has been identifying threats to the environment for many years. Over the past 15 years they have expanded environmental initiatives to include clean, renewable energy.



California has maintained roughly the same per capita energy usage from 1972 to 2006, while the U.S. as a whole has increased per capita energy usage by 50%. California energy effectiveness has been attributed to energy efficiency. Energy effective planning within CA communities will eliminate energy waste and reduce California's overall energy usage.

1.1 Past and Present Energy Planning in Huntington Beach

For nearly two decades, the city of Huntington Beach has taken numerous actions to increase energy effectiveness. Over the years, the council has implemented a number of strategies and projects that reduce energy waste. Even with inevitable turnover the support of the City Council, boards and community for energy effectiveness has continued. Several programs and initiatives illustrate this support.

Prior to the most recent recession, the Capital Improvement Program (CIP) has had consistent annual funding in the range of $150,000-$175,000 for energy efficiency projects. This commitment is essential to provide the required co-funding for most grant opportunities. This funding in previous years completed lighting retrofits at the city's parking garage and city yard. Secondly, a large Energy Saving Performance Contract was approved in 1999 that implemented: (a) lighting retrofits, (b) chilled water system upgrades, and (c) variable frequency drives and controls systems on city facilities.

Further indication of the importance of environmental protection is evident in the action of the city to put in place an Environmental Board over forty years ago. The board studies the environment of the city of Huntington Beach and investigates potential threats to a clean environment for the city and its inhabitants. The board provides recommendations to the city council on environmental issues and opportunities. In early 2010, the council approved an upgrade to the Environmental Board's mission. This included "sustainability" as a keyword and way of thinking that supports; (a) economic development, (b) water and energy conservation, (c) recycling, (d) transportation, (e) open space preservation, and (f) community engagement. Most recently the board has focused on an informative proactive methodology that produces a positive approach to solving environmental problems.

Recent Energy Actions

In1999 and 2001 Sempra Energy Solutions implemented an Energy Saving Performance Contract. This type of contract required Sempra Energy Solutions to conduct a thorough analysis based on a 1995 analysis conducted by Southern California Edison. The final modifications recommended by Sempra Energy Solutions to the HVAC system, city-wide lighting, and the Direct Digital Control system (DDC) produced major savings. These modifications resulted in an annual savings of $318,974, with a simple payback period of 8.6 years. The energy savings annually was 2.4 million kWh and 164 thousand Therms.

1999 & 2001 Energy Performance Contract Details:

Energy Project 1999 & 2001				
Item	Location	Description	Energy Savings kWh	Capital Cost
1	Civic Center	Lighting and Exit Signs	516,881	$46,528
2	Civic Center	Chillers, motors, water pump, air handlers, cooling tower, and boiler.	2,366,460	$190,586
3	Central Library	Motors, water pump, air handlers, boilers.	518,784	$58,131
4	Library & Civic Center	Energy Management System, and an update to an outdated maintenance plan.	0	$50,000
		Totals:	3,402,125	$345,245

The Mayor in 2005, became aware of the risks of peaking oil production, she created awareness among council members and officials about the seriousness of depleting oil reserves. City members participated in a peak oil conference and to this day continue to participate and contribute to reducing energy usage. One of the outcomes of that awareness was the creation of an energy manager position, which has proven to be one of the most beneficial ways of working to eliminate energy waste.

In 2007, City Council provided budget authority to create a new Energy Project Manager (EPM) position. The purpose of this position was to create and administer a long-range energy management program that would meet the goals for the Energy Element of the city of Huntington Beach Strategic Plan. Additionally, the plan included being: (a) creative in implementing initiatives, (b) active in policy change at the local and state levels, and (c) becoming expert in leading Huntington Beach in developing strategies to create a sustainable community. In June of 2008, the city of Huntington Beach hired the new Energy Project Manager.

Within four months of the new hire, the EPM identified $190,000 in recoverable utility costs. The EPM found billing problems when he was reviewing 700 of the city's gas and electric bills. “Their bills are so complex," he said in an interview with OC Register. "There are relatively few people that can fully understand and manage the bills." Sites that had incorrect electrical billing included the Civic Center, Central Library, and a former police department substation. The recurring savings from the initial utility bill audit total $57,000.

On February 2nd, 2009 the Council adopted resolution number 2009-08 in support of the Orange County Cities Energy Leadership Partnership (OCCELP). This led to a major partnership between Southern California Edison and Huntington Beach and provided an active way to link the city's past energy efficiency success with the new energy efficiency goals.

The OCCELP provides the equivalent of a customer loyalty program that increases the incentives the city can earn based on how much energy efficiency they have implemented in the past. The city has moved from the valued partner level to the Silver level, and will continue to advance to the Gold and Platinum levels as more energy efficiency is implemented. The Gold level is worth approximately $57,000 in additional incentives to the city, but to reach Gold status, an EAP document needs to be adopted by the Council. (For more information please see the chart below) According to projections by SCE, the city of Huntington Beach should reach the Gold level in the 2nd quarter of 2011. In addition to energy efficiency, to achieve Gold partner status the city must implement SCE's Demand Response in several facilities. Demand Response participation requires temporarily reducing energy use during peak time in exchange for payment.

One of the additional benefits of the OCCELP is eligibility for grants such as the SCE Flight #5.6 grant in support of the California Energy Efficiency Strategic Plan (CEESP) discussed in Section 3.2 of this report. One of the funded activities will permit the city to utilize the grant to create a regional and robust Enterprise Energy Management Information System (EEMIS). An EEMIS consolidates all of the facilities energy usage data into one management system where staff can maximize the value of the city's energy expenditures. The development of the EEMIS will be a combined effort of five major cities in Orange County including Huntington Beach as part of the OC Partnership program. The grant also includes support for local government facility policy development and adoption, and funding to strengthen regional cooperation between local governments. The regional cooperation focuses on energy management issues and presents an opportunity for HB to diversify some city revenues through the Local Government Energy Management Services Program.

The city also supports sound state level policies such as the California energy resources loading order. Energy Efficiency is the first in the loading order followed by Demand Response, Renewable Energy, and New Generation. Energy efficiency is the most cost-effective and common sense energy policy. For more information on the loading order follow the link below.

http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.pdf

This table links the past present and future of energy efficiency within the "Energy Leadership Partnership":

Level	Criteria	Status	Level Energy Savings	Benefits
Basic	The City has Implement an internal educational campaign and enrolled in Flex alert.	Completed 2010		$0.03 /kWh
Silver	The Water facilities participate in Demand Response from SCE.	Completed 2010	5%	
	One facility has a Peak Demand Reduction Action Plan	Completed 2010		$0.06 /kWh
	Distribute Energy Solutions brochure among partner employees	Completed 2010		
	Complete an Integrated Demand Side Management audit at all eligible facilities greater than 200kW	Completed 2010		
Gold	Conduct marketing outreach to citizens of Huntington Beach on Demand Response programs	2011	10%	$0.09 /kWh
	Get 25% of facilities participating in Demand Response from SCE and develop an Energy Reduction Action Plan for these facilities.	2011		
	One facility to implement Demand Response measure from IDSM audit.	2011		
	Energy Action Plan adopted as policy	2011		
Platinum	Organize a local outreach event to promote demand response.	2012	20%	$0.12 /kWh
	Get 50% of facilities to participate in Demand Response from SCE.	2012		Custom Programs
	One facility to implement Auto Demand Response from SCE	Complete		

Each tier in the partnership program represents a set incentive level for the city. Every increase in tier level increases the incentive for a comprehensive energy project (2,000,000 kWh) by approximately $60,000 or $0.03 cents per KWh saved.

Phase 1 (Monitoring Based Commissioning) Projects:

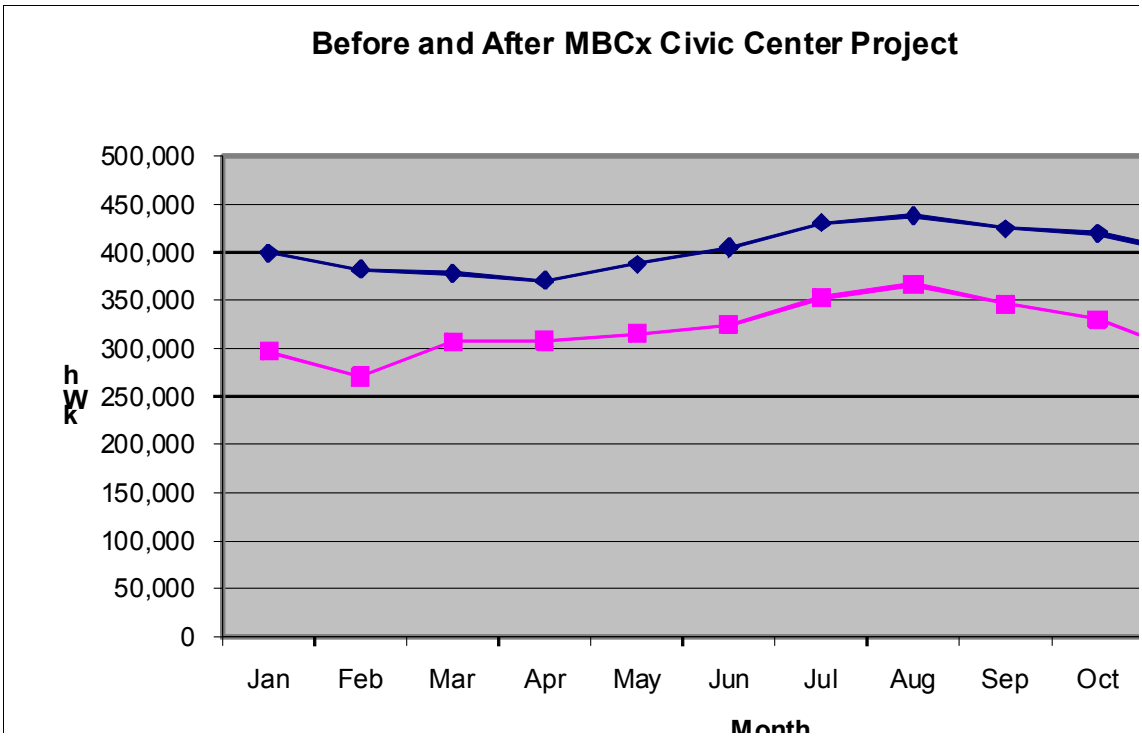
One of the first projects the EPM asked the city council to approve was the Monitoring Based Commissioning (MBCx) Projects for the two largest city facilities. Typical of projects in the early stage of creating a long-term energy management program, they were highly cost-effective. MBCx is a building commissioning process that identifies, and sustains low cost operational and maintenance improvements for buildings and central plant energy systems. The process employs energy monitoring and diagnostic protocols to achieve, and continuously maintain a high level of system performance. Some of the objectives are as follows:

- Identify previously unrecognized inefficiencies in building and plant system operations such as simultaneous heating and cooling
- Enhance building system performance and building comfort
- Measure and document energy savings from resulting operational improvements
- Facilitate ongoing re-commissioning of systems to ensure persistence of savings

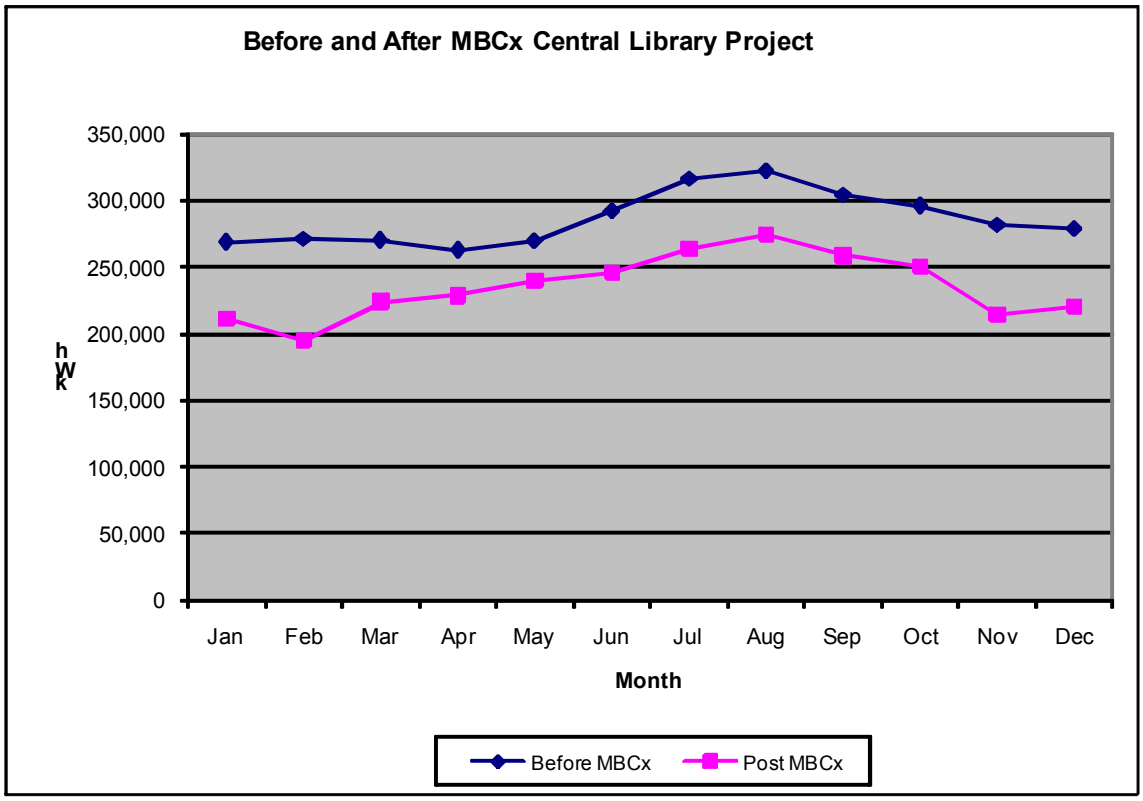
Additionally, the commissioning agent Digital Energy Inc installed computer software that quantifies the complex diagnostic results of the many sensors and then reports visual results to the supervisor and energy manager for maintenance response.

In addition, the city of Huntington Beach Information System Department implemented a PC network energy management software system that was fully reimbursed by SCE, which provides an infinite simple payback measure.

Civic Center



Central Library



After the Phase 1 (MBCx) Energy Projects

Phase 1 Energy Projects			
Location	kWh Saved	Therms Saved	$ Saved
Central Library MBCx	779,961	24,631	$106,601
Civic Center MBCx	1,032,553	27,239	$135,228
PC network energy management software	172,040	0	$21,505
Totals:	1,984,554	51,870	$259,377

2005 City-wide Baseline	Energy Saved	Percent of City energy use
28,441,856 kWh	1,984,554 kWh	7%
1,065,764 Therms	51,870 Therms	4.8%

EECBG Funded projects:

In 2009 the Recovery Act funded the Energy Efficiency and Conservation Block Grant (EECBG) program. This program is for use by the city, county, and state governments. The program is intended to implement energy efficiency and conservation strategies. Some of the program strategies are to reduce the overall energy use, energy audits or retrofits, and provide financial incentives for energy efficiency. Total funding for EECBG is $3.2 billion, and approximately $1.9 billion is available to cities, counties, and Indian reservations. The city of Huntington Beach was granted $1.78M based on the EECBG formula.

Huntington Beach's EECBG allocation of $1.78M is focused in four areas:

A) Solar feasibility project that led to a successful Solar Power Purchase Agreement

B) Energy efficiency retrofits in government facilities

C) GIS Streetlight Audit

D) LED Streetlights

A) Solar feasibility, environmental review, conceptual design, and entitlements

The EECBG grant funded a solar feasibility study. This permitted Huntington Beach to quickly complete environmental reviews, preliminary designs, and entitlements. As well as bidding support from a professional services firm. This activity directly led to a successful solar power purchase agreement with SunEdison.

The professional services firm Digital Energy completed an EIR that resulted in publication of a Mitigated Negative Declaration (MND). Subsequently, on October 18, 2010,

the council approved the solar project that would generate 3,300,000 kWh annually, providing 12 percent renewable energy for HB's facilities.

This project is noteworthy in that it resulted in Huntington Beach taxpayers getting the best value for their normal expenditures on utilities by redirecting them into a solar power purchase agreement. This allowed the inclusion of renewable energy credits in the agreement thus preparing the city for future carbon regulations. This major solar power project is one of the largest public sector installations in Orange County.

SunEdison was selected as the winning bidder for the solar project. Subsequently, the city and SunEdison entered into a 20-year, 2.3 Megawatt Power Purchase Agreement (PPA) contract, with SunEdison providing, owning, and operating the equipment. The city purchases the solar power at a flat rate from SunEdison. According to the terms of this agreement the city is not liable for any capital costs or maintenance. Additionally, the city benefits from shaded parking.

Additional benefits the solar project provides are over the course of the 20-year PPA contract, the city has a projected Net Present Value (NPV) of about $1.55 million. On the environmental side the equivalent of 508 acres of forest will be preserved from deforestation, and, according to the Environmental Protection Agency (EPA), there will be a 2,382 metric tons reduction of emissions of Green House Gas (GHG). This solar power purchase agreement sets an example for other local governments to install significant solar capacity at their facilities.

B) Energy Efficiency retrofits:

The city submitted an energy efficiency and conservation strategy to DOE with an energy savings goal of 15% for the EECBG funding. In support of that goal, subsequent efforts for energy efficiency in municipal buildings were launched when the city of Huntington Beach approved a professional service contract with AECOM to complete an Investment Grade Assessment (IGA). Upon completion of the assessment another Energy Savings Performance Contract will be presented to the City Council for approval. This is a cost-effective approach to achieving energy savings, which also earns incentives from the SCE and SCG's partnership program. Once the IGA is complete, the city will have the information necessary to enter into a construction agreement to proceed with the implementation of the recommended energy efficiency measures.

This construction agreement is projected to be two-thirds funded by the Energy

Efficiency and Conservation Block Grant (EECBG) funding, utility incentives and carbon credit sales. The specific measures will improve the efficiency of city facilities and reduce ongoing utility costs. In addition these projects will reduce the city's deferred maintenance backlog. See section 4.1 for the planned specific Energy Efficiency Measures (EEM).

C) GIS Streetlight Audit

Huntington Beach spends over $2 million annually on almost 14,000 streetlights. Street lighting is the single largest item (in both dollars and energy) on the annual power bill. Following the dictum, "what gets measured gets managed", led the city to perform a Geographic Information System (GIS) based inventory of the fixtures. This is not a new trend as many major cities have benefited from this type of inventory. The project creates a spatially accurate inventory of the street poles in a relatively short period of time. City staff, whose efforts are paid for by the federal grant, create a comprehensive streetlight layer in the city's GIS system. This also benefits the city by providing a way to easily update the system as assets are added or removed.

Once the inventory is analyzed, an effective lighting strategy for HB will be developed. Some strategies that have been used by other cities include, (a) turning off some lights, (b) utilizing more efficient lighting sources (induction or LED), or (c) setting timers for lightly used hours. The city of Santa Rosa, for example, with 16,000 streetlights, is reducing fixtures and operating hours and saving 50% of their street lighting budget. As HB develops the long-term street lighting strategy community engagement will be critical to ensure that the public safety, energy and environmental costs and dark sky benefits are understood. The ability to explore these types of options becomes viable as a result of this inventory.

D) LED Streetlights

As seen from the GIS streetlight audit activity, street lighting is a significant energy use and expense to the city. Ensuring that HB taxpayers receive appropriate value from these expenditures of energy has led staff to pursue strategic LED street light retrofits.

On Main Street, the city was confronted with multiple stakeholder requests that encountered budget and electrical infrastructure constraints. The Business Improvement District (BID) wanted to upgrade the holiday lights and provide auxiliary power for Surf City Nights, yet the existing infrastructure was incapable of supporting these requests. The underground wiring could not provide enough electrical capacity to power both brighter streetlights and holiday lighting simultaneously without digging up the streets to lay new wiring. The Police department needed more and better lighting on Main streets to enhance public safety. Public Works did not have budget to re-work the street lighting circuits and energy costs for street lighting are significant.

These constraints led to a solution for wirelessly controlled dimmable LED streetlights that provided increased light quality while consuming less power and providing the ability to adjust light levels depending on the use at any specific time. This solution avoided the need to dig up the streets and reduced energy consumption while satisfying divergent stakeholder needs. The city became one of the first in the nation to implement such a technology to assist in improving public safety.

This solution had several benefits: (a) provided the Police department better light quality at all times, as well as the ability to increase light levels by 30% in emergencies, (b) provided the electrical capacity for the BID to upgrade the holiday lighting, and (c) reduced energy consumption, as well as the ability to increase light quantity by 30% in emergencies. This creative solution was made possible by the involvement of Council members, the BID, staff from multiple departments, and industry partners. As important as these benefits are, longer term it is important to develop next generation lighting solutions because HB spends over $2M annually for street and area lighting.

Another example of using the newer unique features of LED area lighting allows HB to provide energy services (light) to people not things, allowing reduced light levels and costs when there isn't a need. LED lighting manufacturers have worked with UC Davis to create Bi-level LED fixtures that incorporate an occupancy sensor on the housing, that dims the area when it is unoccupied to 50% and immediately increases to 100% when occupancy is detected.

The city has installed these types of fixtures at several city parks such as, Murdy, Manning and Edison parks. This feature has been shown by UC Davis to enhance perceptions of safety and reduce energy consumption. SCE elected not to participate with HB in these specific energy efficiency measures.

Finally, the Blufftop parking lots served as a testing area with the Kim Lighting Archetype LED retrofit kits. This location is a pure parking lot and provided an opportunity for the city to test out controllable parking lot lights. The gates to the lots are locked at approximately 10pm every night, the lights dim down to save energy shortly thereafter. If needed by the police department, the lights can be illuminated to full brightness similar to the system on Main Street.

Local Government Leadership at National and State Levels

Huntington Beach's Energy Project Manager was selected to serve on the DOE's Energy Efficiency and Conservation Block Grant (EECBG) Sub-committee. The sub-committee makes recommendations to the Assistant Secretary for Energy Efficiency and Renewable Energy on the goals and objectives of the EECBG program. The sub-committee serves as liaison between the EECBG cities, counties, tribes, states, and the Department of Energy. It also provides consensus building among program members. The city of Huntington Beach's Energy Project Manager is the only representative from California, Oregon, Nevada, and Arizona to be chosen to serve on this national advisory committee.

HB's leadership has been recognized by the Natural Resource Defense Council (NRDC) naming Huntington Beach as one of their Smarter Cities. Additionally, So Cal Gas Company has recognized the city's energy project manager as their 2010 Energy Efficiency Champion.

Community Outreach

Huntington Beach partners with the community to promote energy efficiency that expresses shared community values providing a positive feedback loop creating additional energy efficiency momentum. Some of the specific areas of outreach include the (a) Environmental Board and Non-Governmental Organizations (NGO's) programs, (b) incentives programs, (c) Chamber of Commerce's Annual GreenExpo, and (d) the Marketing & Visitors Bureau's Sustainable Tourism Committee and their publication "Steps towards a Sustainable H.B".

Huntington Beach holds an annual Environmental Award event through the Environmental Board. The award is presented at a city council meeting. This year, Southern California Edison sponsored the award with a focus on energy conservation. A $500 financial award is given to the individual and organization awardees that improve the environment. One of this year's recipients was Russ and Susan Kadota, a family in Huntington Beach who remodeled their home. The family incorporated (a) high efficiency lighting, (b) solar tubes, (c) energy efficient appliances, (d) double pane windows and doors, (e) low-flow shower heads, and (f) water efficient toilets, just to name a few.

http://www.hbindependent.com/news/tn-hbi-0127-award-20110121,0,6586741.story

In a cooperative effort, Southern California Edison (SCE) and Huntington Beach are working together to be Electric Vehicle (EV) ready. The primary activity in supporting the newest generation of Plug-in Electric Vehicles (PEV) is ensuring that electrical upgrades in residential garages go smoothly; both HB and SCE are ready to ensure that PEV's are successful and provide information to SCE for them to prepare the infrastructure necessary to accommodate these new energy needs. As part of the SCE research, Huntington Beach was fifth most likely city in Southern California to have high adoption rates of PEV technology. This analysis was based on the rate of hybrid vehicle registration in HB and demonstrates the strong environmental and energy efficiency shared values in HB.

The city, while co-promoting SCE events, has helped its residential customers become solar savvy. HB provides free classes on the California Solar Initiative (CSI) program and the incentives it offers to homeowners who decide to install solar systems on their houses. In 2009, the Mayor proclaimed a solar goal of 8.5 megawatts of installed capacity across the commercial, residential, and municipal sectors, to be achieved in less than 5 years. At the mayor's request, in 2009, the Vice President of SharpUSA Solar presented to the council a program that included additional Sharp Solar incentives to the citizens of Huntington Beach. The HB hometown incentive was a success that resulted in about 100kW of successful solar installations.

In another cooperative effort, the city of Huntington Beach, working with Southern California Edison, will co-promote a Direct Install program in June of 2011. SCE's Direct Install program removes barriers that prevent small businesses from otherwise upgrading to energy efficient equipment. In SCE's Direct Install program small businesses are offered no-cost energy audits and no-cost installation of up to $10,000 in energy efficient lighting, and equipment.

In 2009 the HB Centennial Earth Day was celebrated at Rainbow Disposal Co., Inc. They invited the community to join in the festivities at no cost. Music, food, entertainment, and information on building a sustainable community were provided. SCE's Mobile Education Unit, neighboring cities, and So Cal Gas were present to promote energy efficiency.

The Green Expo, an event of Huntington Beach's Chamber of Commerce, is sponsored by major businesses such as Boeing and Sempra Energy. The exhibitors at the expo are an impressive mix of green businesses in the city. They are able to access new customers with environmental information and knowledge of the businesses within the Huntington Beach community. The previous Green Expo had an attendance of approximately 6,000 people with an estimated 65 exhibitors, active in the Huntington Beach community providing services or products to improve community sustainability.

The Marketing and Visitors Bureau started 2011 off with an outstanding publication "Steps toward a Sustainable Huntington Beach". This document was prepared over the last 2 years by a committee on Sustainable Tourism led by Shirley Dettloff. The Sustainable Tourism Committee is comprised of community members involved in a variety of professions. Their new publication is based on research of Huntington Beach's sustainable activities and provides direction for visitors and the community on creating a sustainable future in Huntington Beach. Follow the link below for the full document.

http://www.surfcityusa.com/surf-city-ecotourism/sustainable.aspx

1.2 Other Department and Affiliate Goals: indirect energy savings – embodied energy

In addition to the efforts of the Energy Project Manager, other city departments are working on energy effectiveness as well. The Community Services department, Information Services department, Library department, and Public Works department have all completed or are currently working to complete energy efficiency and environmental projects. The following illustrates their efforts.

On the Pacific Coast Hwy between 9th street and Seapoint, Community Services has installed standalone solar powered restrooms at the beach. In addition, most parking meters and systems are now solar powered. Previously, Community Services had cleaned up some city diesel tractors. The tractors used for beach cleaning have been fitted with special filters that comply with the ruling of the California Air Resources Board. They filter out 99% of the hazardous diesel particulates.

The Information Services (IS) department has implemented server virtualization to eliminate the wasted energy from the previous practice of dedicating a physical server to each computer system program. The expandability within a single system reduces the need for more computer equipment that in turn requires more electricity. In 2006 the city had approximately 100 servers. After upgrading to the server virtualization system, 93 servers were eliminated at a savings of approximately 233,000 kWh annually. Additionally, the IS department found an economical and an environmentally friendly alternative for printing that increases energy effectiveness, while reducing 25,000 kWh annually. Neither Southern California Edison nor the PUC recognizes this type of efficiency measure though.

The Library is a large multi-user facility with about 93,000 adult cardholders and about 2,000,000 visitors per year. The Library enjoys a unique ability to communicate directly with

the community. The Library is interested in conducting energy education campaigns to service the community at the Library facility. The energy campaigns reach large portions of the community. After all, a large portion of the community utilizes the facility. Additionally, Library staff has supported energy efficiency projects in their facilities.

Another energy efficiency effort of the city of Huntington Beach is recycling. In 2009, it was one of the two top recycling cities identified by CalRecycle. Public Works is the agency responsible for reporting the landfill diversion (recycling) rates to CalRecycle. The Public Works department provides recycling events for the residents to bring old electronics: computers, cell phones, etc. Most impressively the city is using recycled products in municipal projects. For example: a replacement of worn pavement by an asphalt concrete, containing crumb rubber from 200,000 discarded tires, as an alternative to depositing them in a landfill. Additionally, Public Works has implemented solar powered monument signs at the entrances to the city while also including energy efficiency funding in most Capital Improvement Programs. Follow the link below for the full document.

http://www.ocregister.com/news/disposal-128554-waste-recycling.html

The Public Works department is also dedicated to water conservation. Their water conservation efforts are spearheaded by a staff of two people. The staff is supported by the Municipal Water District of Orange County's (MWDOC) water efficiency programs. With the conservation efforts, Huntington Beach has reached a new water usage low of 25% less than 20 years ago despite an increase in population. The city has implemented the Orange County model water code, a water conservation ordinance requiring the reduction of water waste. Huntington Beach has been water-wise for many years, but has recently made extra efforts in water conservation. The conservation efforts are due to current dry weather, and changes in imported water supplies. Indirect benefits of reduced urban runoff make for a cleaner and healthier ocean. The water conservation website is available at the link below.

http://www.huntingtonbeachca.gov/government/departments/public_works/water_conservation/

Further conservation efforts by the Public Works Department involved implementation of the first phase of a weather based irrigation control system from CalSense at ten Parks. This system is fully automated and reduces vehicle trips in the city through its communications capabilities. To date, over a half a million gallons of water have been saved at one park. Eventually, all of the city's parks will incorporate an automated irrigation system with the potential to create 43% water irrigation savings.

SECTION 2 – CITY OF HUNTINGTON BEACH ENERGY USE

City Facilities Energy Use and goals				
Year(s)	**Electricity (KWh)**	**Natural Gas (Therms)**	**Water (acre-feet)**	**Fleet Fuel (Gallons)**
2005 baseline	28,441,856	1,065,764	830	511,184
FY 2009/10	27,480,325	1,257,530	790	471,302
2020 Energy budgets (assuming carbon intensity is static)	22,753,484	852,611	TBD through water planning process	408,947
2020 savings goal (20%)	5,688,371	213,152	TBD through water planning process	102,236

*Highest users water pumping (potable, storm water and sewer), streetlights, Civic Center, Central Library facilities

90% of the natural gas consumption in city facilities is related to water (potable, storm and waste) pumping which are essential services. The loads for all types of water are weather dependent and can account for large year over year swings in energy consumption.

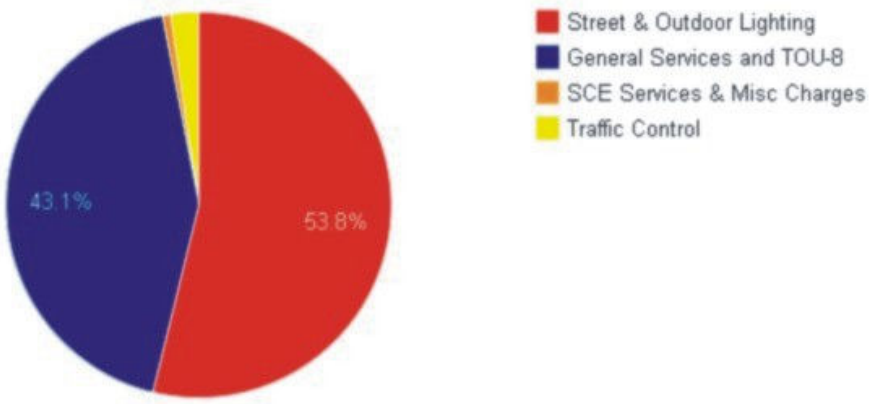
Community Water Use and goals	
Year(s)	**Water (acre-feet)**
2005	32,561
FY 2009/10	28,879
2020 goal (20% savings)	TBD through water planning process

2.1 City of Huntington Beach Selected Top Users Municipal Energy Use

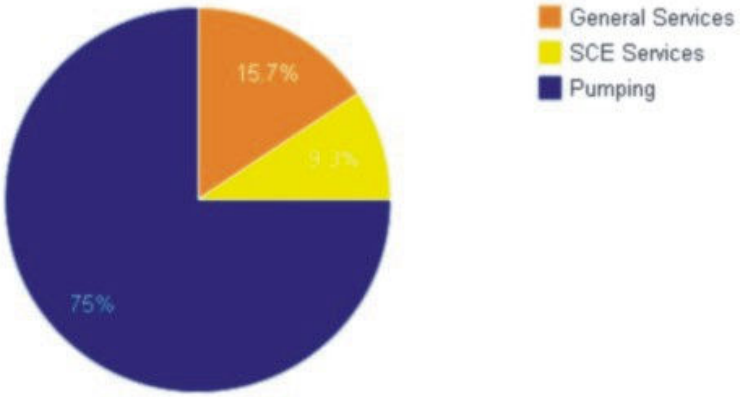
FY 08/09 Municipal Operations Electric Usage		
Municipal Facility	Energy Usage (kWh)	Annual Cost
Street Lights	9,444,035	$2,046,178
Water Pumping	5,445,792	$519,281
City Hall	4,834,000	$563,951
Central Library	3,244,890	$398,031
Traffic Lights	625,100	$89,547
Other	5,836,477	$835,783
Total	29,430,294	$4,452,771

FY 08/09 Municipal Operations Gas Usage		
Municipal Facility	Energy Usage (Therms)	Annual Cost
Water Pumping	905,461	$996,007
City Hall	86,011	$94,612
Central Library	46,509	$51,159
Other facilities	220,663	$242,729
Total	1,258,644	$1,384,508

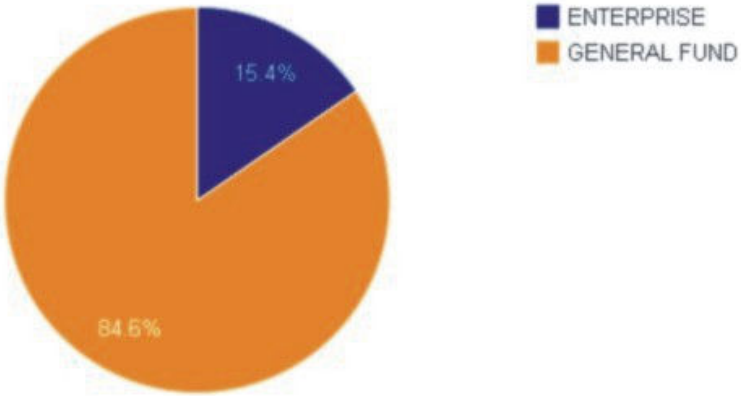
GENERAL FUND



ENTERPRISE FUND



GENERAL FUND VS. ENTERPRISE FUND



2.3 Current Energy Programs/Policies

- Environmentally Preferred Purchasing policy
- Flow-down state policies – AB32
    - 20% less Greenhouse Gas by 2020 or 1990 levels by 2020
- EECBG – Energy Efficiency and Conservation Strategy (EECS) – 20% energy savings plan for government facilities required for EECBG award.
- Energy Action Plan (EAP)

2.4 Possible Objectives

- Specific outreach for community wide goals will seek funding for Community Based Social Marketing
- Seek funding to continuously improve value for taxpayer expenditures on energy
- Seek and promote partnerships
- Cleantech economic development
- Sustainable funding sources

SECTION 3 – CITY OF HUNTINGTON BEACH TARGET REDUCTION GOALS

3.1 City Facility Goals and Strategy

As part of the city's obligation under AB 32 to reduce greenhouse gas emissions by 20%, the city's facilities energy savings goal is to reduce energy use by 20% from a 2005 baseline. The city is well on track to achieving this goal through the projects described above.

The city will have greater control over the energy consumption through a variety of efforts, including: (a) monitoring local government utility accounts, (b) ongoing energy star benchmarking, (c) energy efficiency projects, (d) measurement and verification, and (e) carbon reporting by utilizing an Enterprise Energy Management Information System (EEMIS).

As a benchmark for seeking funding, the city's contribution could reasonably be set at a hurdle rate of a 5-year simple payback or 20% return on investment on single discipline shallow projects and a 10-Year payback, 10% return on investment for deeper more comprehensive retrofits. Projects that meet these criteria as a policy are given high priority for funding and implementation as part of the city's energy action plan including the challenging community-wide energy efficiency goals.

The combination of energy efficiency and solar implementation has allowed Huntington Beach to exceed the 20% reduction in energy/fossil fuel emissions goal articulated in AB 32. Future energy efficiency strategies for city facilities include integrating energy efficiency criteria into Business As Usual (BAU) in capital programs, and retrofitting smaller (< 10,000 SF) buildings.

3.2 City-wide Goals and Strategy

Platinum partner status with Southern California Edison is a noteworthy goal to achieve. This requires 20% energy savings both in community wide and government facilities.

One attractive strategy to engage the community in energy effectiveness action based on social norms rather than the traditional economic incentives would be to utilize Community Based Social Marketing (CBSM). Behavioral finance has illustrated that rational economic incentives many times do not effectively translate into action.

Huntington Beach thrives on sunshine, clean ocean and air, and a prosperous community. The triple bottom line of sustainability—economic, ecological, and society—have equal importance in ensuring community vitality. The EAP's city-wide strategy encompasses these concepts while focusing on implementing sustainable solutions that engage the community. Through the use of CBSM, the city can identify additional barriers that prevent sustainable commitment, and discover ways to promote community engagement with cost effective social marketing tools. The CBSM model offers an additional means of achieving energy efficiency while minimizing the prominence of traditional economic arguments, which have limited persuasive power. This approach has the potential to be more transformative and cost-effective than short term incentives.

The city is committed to CBSM in assisting its citizens and businesses in making a commitment and taking actions to eliminate energy waste. Identifying latent community values, clarifying their expression and marketing calls to action to encourage the expression of community values can be utilized as part of community outreach and education on energy efficiency and other environmental goals in Huntington Beach. This can sustainably drive action to eliminate energy waste. CBSM has potential to be one of the most cost effective ways of fostering 'sustainable' behavior. Tools in CBSM can be utilized to discover barriers in sustainable behavior and pursue marketing actions to implement change that will be sustainable. Social norms create a self-reinforcing positive feedback loop that lead to sustainable actions to eliminate energy waste. One of the tools in CBSM is commitment strategy. In Iowa City, commitment strategy was used and succeeded in reducing energy consumption 10-20% without any capital costs. The author of "Fostering Sustainable Behavior Community-Based Social Marketing", Dr. McKenzie-Mohr, states that the individual tools have been around for a long time and have been used successfully.

Huntington Beach is an excellent candidate for a CBSM pilot program to engage with the community to drive action to eliminate energy waste as an expression of community values. Those community values center on quality of life and local control. The appropriate method ultimately needs to be researched for each campaign. But the CBSM format makes for a very cost effective approach to the community engagement. Accordingly, the city is seeking additional funding to pursue a formalized CBSM process to drive innovation in community adoption of energy efficiency. Future appropriations of EECBG or Public Utility Commission (PUC) Public Goods Charge (PGC) funding will be a critical component in moving towards the next step in community-wide reduction of energy waste. The pursuit of a resilient community in a constrained economy maintains the same reliable tradition that has always been carried out in

the city, namely, that the Huntington Beach community improves the quality of life for the residents of today and the future.

Additional funding for achieving community-wide goals is essential. The program will aggressively pursue energy grant funding to further extend the city's leadership in energy and sustainability.

The CPUC released the California Energy Efficiency Strategic Plan (CEESP). It contained a local government chapter consisting of the following goals:

1. Local governments lead adoption and implementation of "reach" codes, stronger than Title 24.
2. Local governments support energy code compliance.
3. Local government leads energy effectiveness by example.
4. Local government leads the community with innovative programs for energy efficiency, sustainability, and climate change.
5. Local government energy efficiency expertise becomes widespread and typical.

As a result of this potential unfunded mandate from San Francisco, the CPUC provided $32M of funding through SCE to support the local government goals of the CEESP. HB with our partner cities (CM, FV, and Westminster) pursued this competitive funding to support the strategic plan.

Huntington Beach applied on behalf of partner cities to support the 5 goals with regionally appropriate policies and programs. Most aspects of the proposal were not funded, however 3 activities in two topic areas were funded by SCE totaling $1,045,000 in grant funding for the partner cities.

The funded portion of the OCCELP flight #5.6 grant has two components:

- The Enterprise Energy Management Information System (EEMIS) extends and enhances the existing energy management tools. Report and function automation allows management to track energy data more quickly than would otherwise be possible. Quality assurance and quality control of energy data is essential to accurate measurement. This system provides advanced and accurate control of energy data, which reduces risk and improves reliability. Management also has direct access to utility billing, reporting, trending, and many other features. Secondly, the funding will create state of the art local government facility energy policies for OC cities that help lead the community by example.

- Local Government Energy Management Services Program (LGEMSP) is receiving seed funding to create a hands-on energy management office that provides public sector fee for service energy services. The city of Huntington Beach is working on the LGEMSP as a means to increase energy effectiveness in Huntington Beach and other communities. The LGEMSP helps to develop sustainable resources to implement cost effective energy efficient projects that are available and offered to all local governments that would otherwise not be accessible to them on a cost recovery basis from the local government loaning expertise.

The energy policy-making grant provided a conceptual framework that helps produce community-wide energy efficiency, fiscal and environmental results. HB will continue to provide leadership to the community and Southern California through example. The most recent form of organized leadership is the OCCELP, where Huntington Beach and other major Orange County cities utilize marketing, education and outreach. This Amory Lovins quote summarizes HB's approach to community-wide energy efficiency "profitable energy efficiency can drive the business-led journey beyond oil and coal to cheaper, inexhaustible, secure, all-American, climate-safe resources."

Ultimately, funding will be the key to success of the energy action plan and potential reaching the community-wide, 20% greenhouse gas reduction goal. The EPM will continue to aggressively seek funding from grant opportunities and the Council to ensure success.

SECTION 4 – CITY OF HUNTINGTON BEACH ACTION STEPS

4.1 Planned Municipal Facility Energy Efficiency Projects

PLANNED PROJECTS				
Location	Description	Energy Savings (kWh)	Energy Savings (Therms)	Capital Cost
Civic Center	Server Virtualization and Computer Room HVAC Upgrade	90,047		$216,345
Civic Center	Chilled Water System Upgrade	513,599		$1,126,902
Civic Center	AHU Controls and Sequences Upgrades	247,909	23,351	$387,956
Civic Center	Lighting Upgrades	214,688		$176,208
Central Library	Lighting Upgrades	343,822		$229,939
Central Library	HVAC, Controls, and Sequence Upgrades	105,490	9,149	$216,797
Central Library	Library Addition Controls Upgrades	113,562	3,385	$194,883
Central Library	Downsize Theater Transformer	21,900		$21,445
Downtown	Pier and Beach Front Lighting Upgrades	199,382	0	290,640
Lifeguard HQ	IT Room HVAC Upgrades	3,942		$15,179
Gothard & Lake Fire Stations	HVAC upgrades and other measures	6,690	55	$80,172
Rodgers Seniors' Center	Replace Furnaces		255	$25,864
City Gym	Pool Heating System Upgrade		1,321	$50,197
Sports Complex	Restroom Lighting Upgrade	7,726		$3,912
Multiple Buildings	Upgrade Thermostats with Communicating Programmable Internet Thermostats (Edison, Murdy, etc)	8,972		$37,199
	TOTALS:	1,877,729	37,140	$3,069,487

Future Projects
Smaller Facility (< 10,000 SF) retrofits such as Fire Stations, Community Centers, etc.
Infrastructure as it is replaced designed around energy efficiency and resilience

4.2 Funding of Projects

These projects will be funded by various mechanisms as follows:

- Federal or State grants funding.
- Energy savings re-investment policy through Measurement and Verification (M&V).
- Historically HB has budgeted about $150K annually in the Capital improvement Plan (CIP) for energy efficiency projects. This commitment should continue once the budgets normalize from the current recession.
- Future EECBG funding will allow the city of Huntington Beach to accelerate implementation of a significant array of energy efficiency and renewable energy projects. Including programs that target community wide energy efficiency.
- California Energy Commission (CEC) low interest local government loans for energy projects must be repaid from energy cost savings within 10 years.
- On-Bill Financing (OBF), zero interest rate financing for energy efficient equipment.
- Fee for service for administrative and/or time burdens.
- Tax exempt equipment lease financing.
- Qualified Energy Conservation Bonds (QECBs)
- Carbon financing mechanisms such as Verified Emission Reductions (VERs)**,** Energy Efficiency Credits (EECs), etc.

One of the most successful aspects of hiring an Energy Project Manager is the ability to secure Non-General Fund revenue in support of the energy management program. The table below provides a summary of these revenues.

Non-general fund revenue to HB from energy projects	
EECBG	$1.787 million
MBCx IS incentives	$11,640
MBCx incentives	$300,030
AECOM project incentives	$373,776
SCE Flight #5.6 grant	$1,045,000
Energy Efficiency Credits (EECs)	Potentially $465,000 annually for 10 years
SCE sponsorship of Environmental Award	$2,000
Reimbursement for city's costs on Solar	$150,000
Total:	~$4 million

4.3 Future Guidelines or Policies - as an expression of community values

"**More than ambition, more than ability, it is rules that limit contribution; rules are the lowest common denominator of human behavior. They are a substitute for rational thought." (Admiral Rickover)**

The future policy-making for Huntington Beach will focus on the (a) benefits of a cleaner environment, (b) eliminating energy waste, and (c) improving energy effectiveness. The city will lead with programs that demonstrate an expression of community values and fiscal responsibility. Implementing flexible, streamlined programs will permit the city to comply with state and federal regulation and create policies that reduce the undue burden of complex state programs, while maintaining local control. Local control of programs allows the Orange County cities to maintain consistency, reduce complexity, and increase economic value.

Future potential policies:

- Integration with capital projects to influence upstream efficiency opportunities that incorporate energy efficiency and sustainability into the design program.
    - Owner's project requirements
    - Basis of Design documents
- Peak oil /Climate Action Plan with technical assistance from DOE
- Local Government facilities – service level and energy policy
- Compliance with State & Federal mandates in the least heavy-handed manner

For example, Huntington Beach has implemented public art guidelines. The guidelines are voluntary for developers in the use of public art. Over time, developers have nearly universally followed the guidelines. The city of Huntington Beach will develop policy that provides energy effective guidelines rather than mandates. If one were to use the carrot & stick analogy: if you want sustainable behavior you entice with a carrot, and if you want a short-term response that rewards minimum compliance use a stick.

4.4 Tracking

The city of Huntington Beach will monitor energy usage and track energy reduction progress with the use of an Enterprise Energy Information Management System. The city will utilize the funding from the Southern California Edison Flight #5.6 grant to implement this system.

Some of the potential reporting methods are:

- Bi-annual reports to council
- Environmental Board annual report
- Energy Star benchmarking

SECTION 5 – CONCLUSION

The city of Huntington Beach has a track record for recognizing and resolving environmental issues within the city. Specifically, in this report, Huntington Beach has demonstrated commitment to eliminating energy waste, preparing for peak oil production and reducing pollution and is well on its way to complying with future state and federal energy policy while prospering in a fossil fuel constrained economy.

Huntington Beach's energy management program leads the way in local government energy effectiveness. The ability to leverage outside funding sources and partnerships are key strategies that have driven the success of the energy program to date. The completed projects to date have achieved 43% of the energy savings goal and once the pending projects are complete HB will achieve 128% of the electricity goal. The natural gas goal is more challenging given the city's water systems use a significant amount natural gas for potable and storm water pumping. These long lived and expensive infrastructure assets are an essential making the natural gas savings goal more difficult and costly to achieve. However, at the completion of the pending projects the city will be at 42% of the 2020 natural gas savings goal.

Looking forward to 2012 and beyond, it is important to restore the traditional annual CIP funding for energy projects to help in securing additional grant funding to ensure that Huntington Beach sustains its leadership in energy effectiveness in Southern California in its own facilities. This success can then be used to effectively lead the larger community through eliminating energy waste through community based social marketing activities.

The table on the following page provides an avoided energy use and cost summary for all of the completed and pending energy projects in HB as well as an indication of performance against goal. This table illustrates that HB is well positioned to continue to invest in eliminating energy waste and pollution.

Huntington Beach led the last energy revolution in Southern California with oil production. This legacy has contributed to the quality of life that characterizes HB. HB is exercising leadership in the next energy revolution to provide a strong, resilient and sustainable city and lifestyle for generations to come.

Energy Projects to date:			
Location	kWh Saved	Therms Saved	Annual Savings/ Value
Energy projects completed pre- 2005			
Sempra Energy contract	2,400,000	164,000	$345,245
Energy projects post-2005			
Parking Garage Lighting	187,760	0	$28,163
City Yard High Bay Lighting	100,329	0	$13,043
City Gym High Bay Lighting	16,162	0	$2,263
Civic Center MBCx	1,032,553	27,239	$135,228
Central Library MBCx	779,961	24,631	$106,601
PC network energy management software	172,040	0	$21,505
Downtown LED streetlights	124,797	0	$12,480
Utility Audit	42,663	0	$57,000
Totals:	**2,456,265**	**51,870**	**$376,283**
2020 (20%) Goals:	5,688,371	213,152	
Percent of Goal	43%	24%	
Pending Energy Projects:			
SunEdison Solar PPA	3,300,000	0	$1.55M NPV
AECOM Projects	1,859,644	37,507	$250,000
Percent of Goal after completion of planned projects	134%	42%	$626,283

Acknowledgements:

Michael T. Needham is gratefully acknowledged for his diligence in compiling and authoring the bulk of this report. This project represents his Senior Project earning a Bachelor of Arts degree in Sustainable Community Development from Prescott College.

All city staff and elected officials for their support that has made the progress described in this report possible.

SCE and So Cal Gas for their efforts in making Local Government Energy Efficiency Partnerships successful based on PUC funding.

ACRONYM GLOSSARY:

BID - Business Improvement District	EPM – Energy Project Manager	PUC – Public Utilities Commission
CBSM – Community Based Social Marketing	HB – Huntington Beach	SCE – Southern California Edison
CEC – CA energy commission	HVAC – Heating, Ventilating and Air Conditioning	SCG – Southern California Gas
CEESP - California Energy Efficiency Strategic Plan	IS – Information Systems	VFDs – Variable Frequency Drives
CIP - Capital improvement Plan	LED – Light Emitting Diode	
CSI - California Solar Initiative	MBCx - Monitoring Based Commissioning	
DDC - Direct Digital Control system	NGO – Non-Governmental Organization	
EAP – Energy Action Plan	OBF – On Bill Financing	
EECBG – Energy Efficiency and Conservation Block Grant	OC – Orange County	
EEIMS – Enterprise Energy Information Management System	OCCELP - Orange County Cities Energy Leadership Partnership	